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CLATMS

- A photocatalyst module comprising a substrate, a
 photocatalyst, and a protective layer containing lithium
 silicate provided between the substrate and the photocatalyst.
- 5 2. The photocatalyst module according to claim 1 wherein said protective layer containing lithium silicate is a film obtained by applying a paint prepared from a vehicle containing 80 to 90 % by weight of lithium silicate and 10 to 20 % by weight of sodium silicate on the surface of said 10 substrate.
 - 3. The photocatalyst module according to claim 2 wherein said vehicle further contains 0.1 to 10 % by weight of a resin emulsion which is not gelatinized under an alkaline condition of a pH of 11 to 12.
 - The photocatalyst module according to any one of claims
 to 3 wherein said photocatalyst is titanium oxide.
 - 5. The photocatalyst module according to any one of claims 1 to 4 wherein said photocatalyst is in a shape of a layer of particles.
- 20 6. A process for producing a photocatalyst module having a layer of a photocatalyst on the surface thereof comprising forming a film containing lithium silicate on a substrate and then forming the layer of a photocatalyst on the surface of the film.
- 25 7. The process for producing a photocatalyst module according to claim 6 wherein said film containing lithium silicate is formed by applying a paint prepared from a

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vehicle containing 80 to 90 % by weight of lithium silicate and 10 to 20 % by weight of sodium silicate on the surface of said substrate.

- 8. The process for producing a photocatalyst module according to claim 7 wherein said vehicle further contains 0.1 to 10 % by weight of a resin emulsion which is not gelatinized under an alkaline condition of a pH of 11 to 12.
 - 9. The process for producing a photocatalyst module according to any one of claims 6 to 8 wherein the molar ratio of lithium oxide (Li₂O) to silicon dioxide (SiO₂) (lithium oxide: silicon dioxide) in the lithium silicate is 1:3.
 - 10. The process for producing a photocatalyst module according to any one of claims 6 to 9 wherein the formation of said layer of a photocatalyst is carried out by a flame spray coating method.
 - 11. A photocatalyst reaction apparatus provided with a photocatalyst module defined in any one of claims 1 to 5.
 - 12. A photocatalyst reaction apparatus comprising a water tank provided with a photocatalyst module defined in any one of claims 1 to 5, water introducing means, water discharging means, and means for radiating ultraviolet rays.
 - 13. A photocatalyst reaction apparatus comprising a water tank on at least a part of the inner wall surface of which tank a photocatalyst is provided through a protective layer containing lithium silicate, the water tank further having means for introducing water to be treated, means for

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discharging the treated water, and means for radiating ultraviolet rays each provided at or in the water tank.

- 14. The photocatalyst reaction apparatus according to claim 13 wherein said apparatus comprises at least two water
- 5 tanks connected in series, the means for radiating ultraviolet rays provided in a first water tank is means for radiating ultraviolet rays of a medium wavelength of 170 to 260 nm, and the means for radiating ultraviolet rays provided in a second water tank is means for radiating ultraviolet

 10 rays of a long wavelength of 310 to 370 nm.
 - 15. The photocatalyst reaction apparatus according to claim 14 wherein said apparatus further comprises a tank used for mixing ozone formed by radiating ultraviolet rays of a short wavelength of 183 to 184 nm to air with water to be treated and placed at a position preceding said first water tank in the order of treatments.